

Date: Tue, 11 Oct 94 13:09:27 PDT  
From: Info-Hams Mailing List and Newsgroup <info-hams@ucsd.edu>  
Errors-To: Info-Hams-Errors@UCSD.Edu  
Reply-To: Info-Hams@UCSD.Edu  
Precedence: List  
Subject: Info-Hams Digest V94 #1113  
To: Info-Hams

## Today's Topics:

gn/address databases-privacy issue (2 msgs)  
FM subcarrier  
Get Over It  
Info-Hams Digest V94 #1101  
Need Help With IC2GAT  
Repeater/Tower noise problem?  
St. Louis Hamfest  
subscribe rec.radio.amateur.misc  
TUTORIAL: dB & dBm  
WANTED: TAC-TEC 310sx  
WTB: Radar gun... (5 msgs)

Send Replies or notes for publication to: <Info-Hams@UCSD.Edu>  
Send subscription requests to: <Info-Hams-REQUEST@UCSD.Edu>  
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Info-Hams Digest are available (by FTP only) from UCSD.Edu in directory "mailarchives/info-hams".

We trust that readers are intelligent enough to realize that all text herein consists of personal comments and does not represent the official policies or positions of any party. Your mileage may vary. So there.

Date: 10 Oct 1994 21:58:02 -0400  
From: ab4tf@aol.com (AB4TF)  
Subject: Callsign/address databases-privacy issue

In article <37c6sf\$nvv@engnews1.Eng.Sun.COM>, wdh@Eng.Sun.COM (Dennis Henderson) writes:

Obviously, not much can be done for your privacy if you are already listed in a publication or on-line database. However, send a certified letter to those organizations that are publishing lists of amateurs and request that your name be removed from all future issues. I suspect that they have an obligation to remove you at your request...but as I said, that doesn't do

anything for previous publications in which you may appear.

See a good lawyer.

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Date: 11 Oct 1994 17:25:13 GMT  
From: benedict\_m@dd.palmer.edu (Mike Benedict)  
Subject: Callsign/address databases-privacy issue

>I'm concerned with having my name and address available publically  
>via call books and the like. I am very uncomfortable having  
>folks know I am not home (from overhearing my conversations) and  
>being able to get my address from a public database.

>

>I notice on the 610 form that public access is granted to information  
>on the form. Is there a way to prevent the distribution?

>

>I hear a lot of folks on the local repeaters telling folks they  
>are going on vacation. Acces to callsign/address information can  
>lead to one's house getting broken into. I strongly suspect this  
>in a recent burglary.

>

>Is there another route to privacy besides getting a PO box?

I used to use a PO box, but even that isn't going to stop someone. Its a simple matter to look up anyones address in the city directory which can be found in your local library. I don't think there is anyway of staying out of that book (unfortunately). I now have a rural route address so I don't worry about it anymore.

Either way, I never mention my travel plans over the air. I may talk about where I've been after the fact, but never before.

Mike Benedict - KA9GSC

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Date: 10 Oct 1994 19:27:50 -0700  
From: rdcole@crl.com (Ron Cole)  
Subject: FM subcarrier

Albert Tyson (tysona@mcmill.cis.mcmaster.ca) wrote:  
: How can a normal FM radio be used to receive subcarrier FM?

Well sort of. You need a Subcarrier demodulator. Somthing like a XR2211 will do the job.

Ron

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Date: 11 Oct 94 12:54:53 GMT  
From: William=E.=Newkirk%Pubs%GenAv.M1b@ns14.cca.rockwell.COM  
Subject: Get Over It

>Maybe we SHOULD drop the questions on which frequency represents black in ATV  
>operation, and stick to that which is truly common across all modes and bands?

isn't this FSK SSTV you're talking about here rather than ATV (that follows  
regular broadcast standards for the most part)?

bill wb9ivr

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Date: 11 Oct 94 16:18:37 GMT  
From: Fitzgerald\_Curt/amer\_support@qad.COM  
Subject: Info-Hams Digest V94 #1101

Item Subject: Message text  
unsubscribe

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Date: 11 Oct 1994 17:02:32 GMT  
From: Ryan.Jagoe@ucsd.edu  
Subject: Need Help With IC2GAT

Obout a mouth ago I droped (oops) my IC2GAT. I have not had very much  
time to take an extensive look at the guts to see what the cause of my  
problem is. I get very low audio output from the speaker and also if  
I connect an external speaker. Maybe someone has had a similar problem  
and could give me some advice. I don't feel like sending it half  
way across the country to get it fixed.

Thanks for the help,

Ryan, VE9BL

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Date: 11 Oct 1994 13:02:47 -0500  
From: David\_Bourque/UB\_Networks@UB.com (David Bourque/UB Networks)  
Subject: Repeater/Tower noise problem?

OK,

I've been trying to chase down a noise problem on a 2 meter repeater for over a year now. I'm running out of things to look at. I'm down to guessing that I have a noise generator on the tower itself but would like to solicit comments. The installation is on a 160 foot tower, the 2 meter antenna is one of four at the top. Two of the other three are 222 and 449 repeaters. The forth is a control receiver antenna in the 222 band. The tower also has several commercial services on it. One in the low band, one pager in the 154 range, one pager at 929Mhz almost at the very top and also a CAP repeater in the 2 meter range. The tower also has three stacked 40 meter yagis on it. If you can picture this you can see that it is a mess. Oh, did I mention that the tower also supports a 160 meter vertical off the south facing side? Anyway, not all the feedlines are jacketed. This is where I think my problem arises. I've theorized that somewhere on the tower we've got a diode junction between the tower and one of the feedlines. Has anyone got any experience with this kind of problem? If so, how does it manifest itself. What are the symptoms. How can one prove it without replacing the feedline or insulating from the tower. In principle I know it should be done but it is not my tower and I don't have complete control over what is on it. I need some supporting evidence before I go and put some effort into getting it fixed. Just to provide some more data points here is what has happened lately. This summer a new station master antenna was installed. This replaced a Diamond brand that was up there. My noise problem got worse. We replaced the 1/2 inch hardline with 7/8 hardline two weeks ago. My noise problem got worse. The receiver was tested using both an HP signal generator and by a commercial Motorola shop. The repeater is a Motorola Micor. With the antenna disconnected and the test gear connected to the receiver we have no noise. If I connect the signal generator to an antenna on the bench I can hear the problem. Now, the problem sounds like desense. Yet the transmitter is spectrally clean. Full quieting signals become very noisy or drop out completely for no apparent reason. All other transmitters at the site have also been confirmed as clean. I'm running out of things to look at. Can anyone offer any suggestions? All for now. I've consumed enough bandwidth.

email me directly or post to the group, either is fine.

WB1FLD

David Bourque

dbourque@ub.com

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Date: Wed, 5 Oct 94 20:46:00 -0640  
From: tony.fischer@travel.com (Tony Fischer)  
Subject: St. Louis Hamfest

The 3rd annual Halloween Hamfest will be held Saturday October 29th 1994 from 8:30 am to 2:00pm. The location is the same as previous years West County Tech. Hwy 40 & Maryville Centre Dr. in St.

Louis Mo. Talk-in will be on 146.34/94. First prize will be a Yaesu FT2500 2M mobile radio. Vendor info please call Walt Garrett at 314-831-6918.

Tony

\* 1st 1.11 #3331 \* At least those who drink know what to blame everything on  
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\* TRAVEL ONLINE: 81,000 files; 2,500 conferences, 110 game doors.

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Date: 11 Oct 94 12:24:43 GMT  
From: William=E.=Newkirk%Pubs%GenAv.Mlb@ns14.cca.rockwell.COM  
Subject: subscribe rec.radio.amateur.misc

>>imagine if prodigy had usenet access. This may be the tip of the iceberg.  
>guess what.....it does, and it should be showing up any day now.....  
>David Palmer DPalmer@ix.netcom.com

oh geez, this is going to be interesting...will prodigy be censoring what goes out, what comes in, or just attempting to cancel everything they find objectionable?

i wonder if they still have a size limit to postings and mail?

will they make the P\* users use vi for an editor..?

bill wb9ivr  
(new email addrs for the pile: wnewkirk@iu.net)

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Date: Tue, 11 Oct 1994 17:23:05 GMT  
From: phb@syseng1.melpar.esys.com (Paul H. Bock)  
Subject: TUTORIAL: dB & dBm

#### USING AND UNDERSTANDING DECIBELS

by

Paul H. Bock, Jr. K4MSG

Author's Note: This tutorial was originally written for the use of non-RF/analog engineers (digital, software) and non-engineers who needed an easy-to-follow reference on the general use of the decibel. I hope that some amateur operators may find it useful as well.

While the historical accuracy of the comments relating to the telephone company and telephone company engineers may be open to question (the information as supplied to me was anecdotal), the technical points made should be valid regardless of the exact turn of history.

\*General\*

The decibel, or dB, is a means of expressing either the gain of an active device (such as an amplifier) or the loss in a passive device (such as an attenuator or length of cable). The decibel was developed by the telephone company to conveniently express the gain or loss in telephone transmission systems. The decibel is best understood by first discussing the rationale for its development.

If we have two cascaded amplifiers as shown below, with power gain factors A1 and A2 as indicated, the total gain is the product of the individual gains, or  $A_1 \times A_2$ .

Input >----- Amp #1 ----- Amp #2 -----> Output

A1 = 275                    A2 = 55

In the example, the total gain factor  $A_t = 275 \times 55 = 15,125$ . Now, imagine for a moment what it would be like to calculate the total gain of a string of amplifiers. It would be a cumbersome task at best, and especially so if there were portions of the cascade which were lossy and reduced the total gain, thereby requiring division as well as multiplication.

It was for the reason stated above that Bell Telephone developed the decibel. Thinking back to the rules for logarithms, we recall that rather than multiplying two numbers we can add their logarithms and then take the antilogarithm of this sum to find the product we would have gotten had we multiplied the two numbers. Mathematically,

$$\log (A \times B) = \log A + \log B$$

If we want to divide one number into another, we subtract the logarithm of the divisor from the logarithm of the dividend, or in other words

$$\log (A/B) = \log A - \log B$$

The telephone company decided that it might be convenient to handle gains and losses this way, so they invented a unit of gain measurement called a "Bel," named after Alexander Graham Bell.

They defined the Bel as

$$\text{Gain in Bels} = \log A$$

where  $A$  = Power amplification factor

Going back to our example, we find that  $\log 275 = 2.439$  and  $\log 55 = 1.740$ , so the total gain in our cascade is

$$2.439 + 1.74 = 4.179 \text{ Bels}$$

It quickly occurred to the telephone company engineers that using Bels meant they would be working to at least two decimal places. They couldn't just round things off to one decimal place, since 4.179 bels is a power gain of 15,101 while 4.2 bels is a power gain of 15,849, yielding an error of about 5%. At that point it was decided to express power gain in units which were equal to one-tenth of a Bel, or in deci-Bels. This simply meant that the gain in Bels would be multiplied by 10, since there would be ten times more decibels than Bels. This changes the formula to

$$\text{Gain in decibels (dB)} = 10 \log A \quad (\text{Eq. 1})$$

Again using our example, the gain in the cascade is now

$$24.39 + 17.40 = 41.79 \text{ decibels}$$

The answer above is accurate, convenient to work with, and can be rounded off to the first decimal place with little loss in accuracy; 41.79 dB is a power gain of 15,101, while 41.8 dB is a power gain of 15,136, so the error is only 0.23%.

What if the power gain factor is less than one, indicating an actual power loss? The calculation is performed as shown above using Equation 1, but the result will be different. Suppose we have a device whose power gain factor is 0.25, which means that it only outputs one-fourth of the power fed into it? Using Equation 1, we find

$$G = 10 \log (0.25)$$

$$G = 10 (-0.60)$$

$$G = -6.0 \text{ dB}$$

The minus sign occurs because the logarithm of any number less than 1 is always negative. This is convenient, since a power loss expressed in dB will always be negative.

There are two common methods of using the decibel. The first is to express a known power gain factor in dB, as just described. The second is to determine the power gain factor and convert it to dB, which can all be done in one calculation. The formula for this operation is as follows:

$$G = 10 \log \frac{P_o}{P_i} \quad (\text{Eq. 2})$$

where  $G$  = Gain in dB  
 $P_o$  = Power output from the device  
 $P_i$  = Power input to the device

Both  $P_o$  and  $P_i$  should be in the same units; i.e., watts, milliwatts, etc. Note that Equation 2 deals with power, not voltage or current; these are handled differently when converted to dB, and are not relevant to this discussion. Below are two examples of the correct application of Equation 2:

Ex. 1: An amplifier supplies 3.5 watts of output with an input of 20 milliwatts. What is the gain in dB?

$$G = 10 \log \frac{3.5 \text{ watts}}{0.02 \text{ watts}}$$

$$G = 10 \log (175)$$

$$G = 10 (2.24)$$

$$G = 22.4 \text{ dB}$$

Ex. 2: A length of coaxial transmission line is being fed with 150 watts from a transmitter, but the power measured at the output end of the line is only 112 watts. What is the line loss in dB?

$$G = 10 \log \frac{112 \text{ watts}}{150 \text{ watts}}$$

$$G = 10 \log 0.747$$

$$G = 10 (-0.127)$$

$$G = -1.27 \text{ dB}$$

### \*Non-relative (Absolute) Uses of the Decibel\*

The most common non-relative, or absolute, use of the decibel is the dBm, or decibel relative to one milliwatt. It is different from the dB because it represents, in physical terms, an absolute amount of power which can be measured.

The difference between "relative" and "absolute" can be understood easily by considering temperature. For example, if I say that it is "20 degrees colder now than it was this morning," it's a relative measurement; unless the listener knows how cold it was this morning, it doesn't mean anything in absolute terms. If, however, I say, "It was 20 degrees C this morning, but it's 20 degrees colder now," then the listener knows exactly what is meant; it is now 0 degrees C. This can be measured on a thermometer and is referenced to an absolute temperature scale.

So it is with dB and dBm. A dB is merely a relative measurement, while a dBm is referenced to an absolute quantity: the milliwatt (1/1000 of a watt). We can apply this concept to Equation 1 as follows:

$$dBm = 10 \log (P) (1000 \text{ mW/watt})$$

where  $dBm$  = Power in dB referenced to 1 milliwatt  
 $P$  = Power in watts

For example, take the case where we have a power level of 1 milliwatt:

$$dBm = 10 \log (0.001 \text{ watt}) (1000 \text{ mW/watt})$$

$$dBm = 10 \log (1)$$

$$dBm = 10 (0)$$

$$dBm = 0$$

Thus, we see that a power level of 1 milliwatt is 0 dBm. This makes sense intuitively, since our reference power level is also 1 milliwatt. If the power level was 1 watt, however, we find that

$$dBm = 10 \log (1 \text{ watt}) (1000 \text{ mW/watt})$$

$$dBm = 10 (3)$$

$$dBm = 30$$

The dBm can also be negative, just like the dB; if our power level is 1 microwatt, we find that

$$dBm = 10 \log (1 \times 10E-6 \text{ watt}) (1000 \text{ mW/watt})$$

$$dBm = -30 \text{ dBm}$$

Since the dBm is an absolute amount of power, it can be converted back to watts if desired. Since it is in logarithmic form it may also be conveniently combined with other dB terms, making system analysis easier. For example, suppose we have a signal source with an output power of -70 dBm, which we wish to connect to an amplifier having 22 dB gain through a cable having 8.5 dB loss. What is the output level from the amplifier? To find the answer, we just add the gains and losses as follows:

$$Output = -70 \text{ dBm} + 22 \text{ dB} + (-8.5 \text{ dB})$$

$$Output = -70 \text{ dBm} + 22 \text{ dB} - 8.5 \text{ dB}$$

$$Output = -56.5 \text{ dBm}$$

As a final note, power level may be referenced to other quantities and expressed in dB form. Below are some examples:

dBW = Power level referenced to 1 watt

dBk = Power level referenced to 1 kilowatt (1000 watts)

One other common usage is dBc, which is a relative term like dB alone. It means "dB referenced to a carrier level" and is most commonly seen in receiver specifications regarding spurious signals or images. For example, "Spurious signals shall not exceed -50 dBc" means that spurious signals will always be at least 50 dB less than some specified carrier level present (which could mean "50 dB less than the desired signal").

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( _ ) * E-Systems/Melpar Div.	* Telephone: (703) 560-5000 x2062
) * 7700 Arlington Blvd.	* Internet: pbock@melpar.esys.com
* Falls Church, VA 22046	* Mailstop: N203

"Imagination is more important than knowledge." - Albert Einstein

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Date: 11 Oct 1994 03:23:38 GMT

From: hutchine@river.it.gvsu.edu (E.Hutchinson-N8XHP)  
Subject: WANTED: TAC-TEC 310sx

I am looking for Tac-Tec UHF or VHF radios...if you have any or know the whereabouts of any...please let me know...

--  
=====

= Eric M. Hutchinson - N8XHP Grand Valley State University =  
= \* HAZMAT \* Allendale, Michigan \* BLS/CPR \* =  
=====hutchine@river.it.gvsu.edu=====

Date: 10 Oct 94 19:45:15 GMT  
From: daveb@dgtl.com (David Breneman)  
Subject: WTB: Radar gun...

JERRY NORMANDIN (jnормandin@umassd.edu) wrote:  
: In article <373pj9\$600@news.it.gvsu.edu>, hutchine@river.it.gvsu.edu  
(E.Hutchinson-N8XHP) writes:  
: > I am looking to purchase a CHEAP, USED radar gun...X or K band  
: >is not important. Wanted to take surveys in the area for school project.  
: MAKE SURE YOU USE CAUTION WHEN YOU USE THE RADAR GUN!! THEY CAUSE CANCER!  
: That's why Laser RADAR is now used!

THAT'S NOT QUITE TRUE!! :-) If you drive around in a car 10-12 hours a day for 10 years with a radar gun in your lap, you'll definitely hard boil the ol' familial eggs. That's just natural selection at work. I'll brush off the fact that there is no such thing as "Laser RADAR", and comment that LIDAR accounts for only a small percentage of the tax-collector's arsenal. It's cumbersome, expensive, may pose health threats of its own (ie, shining coherent infrared laser light into the eyes of millions of motorists year after year could be dangerous as well - although not to Officer Friendly).

--  
David Breneman Email: daveb@jaws.engineering.dgtl.com  
System Administrator, Voice: +1 206 881-7544 Fax: +1 206 556-8033  
Product Development Platforms  
Digital Systems International, Inc. Redmond, Washington, U. S. o' A.

Date: 11 Oct 94 12:32:55 GMT  
From: William=E.=Newkirk%Pubs%GenAv.M1b@ns14.cca.rockwell.COM

Subject: WTB: Radar gun...

>I suggest you read up on bio physics!  
>all matter, including our cell structure is bipolar.  
>that's why gravity has an effect on our body

I guess you don't need to take classical mechanics and physics to get in the laser program at the lincoln lab, eh? I sure don't recall any bits about "polarity" in the high school and college physics classes i had to take with respect to gravity.

Of course, if you're trying to spill the beans on upsidaisyium, you'll find Jay Ward beat you to the punch by about 30 years.

>I don't know about you but I wouldn't want a 250Watt RADAR sitting on my lap  
i probably wouldn't either...but then i don't recall too many of those guns  
available commercially ... i want to say that you're off by a couple of orders  
of magnitude or more. we are talking lightweight equipment here that's  
operated off of car power, not a small 110V microwave oven.

bill wb9ivr

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Date: Tue, 11 Oct 1994 04:48:46 GMT  
From: billn@hpcvaac.cv.hp.com (bill nelson)  
Subject: WTB: Radar gun...

gary@ke4zv.atl.ga.us (Gary Coffman) writes:  
: In article <1994Oct10.075613.7018@hpcvaac.cv.hp.com> billn@hpcvaac.cv.hp.com  
(bill nelson) writes:  
: >jnormandin@umassd.edu (JERRY NORMANDIN) writes:  
: >  
: >: I suggest you read up on bio physics!  
: >: all matter, including our cell structure is bipolar.  
: >  
: >What does this mean?  
:  
: It means cells are affected by electric fields, same way a bar magnet  
: will align with an external magnetic field. It's the principle behind  
: electrophoresis. During cell division, while the nucleus is splitting,  
: the cell is particularly vulnerable to electric fields. As far as I  
: know, magnetic fields aren't implicated in this at all.

Note that the person said "all matter". That is why I was wondering about the usage of the term.

: >How did they do this? All the ones I have seen had the transmitter in the  
: >head - which was aimed at the automobile. Kind of hard to do that if you  
: >are holding it in your lap. The readout unit may have been held in their  
: >laps, however - and they may have contained a high voltage power supply.  
:  
: Well, obviously, the handheld radar guns used by police are \*not\* 250 watts.  
: They are in fact in the range of 10 \*milliwatts\* to 25 \*milliwatts\*.

Correct.

: However, cops are in the habit of resting the guns in their laps when they  
: aren't actively clocking a vehicle, and they \*don't turn them off\* for the  
: entire shift. So they get a good near field dose to the testicles. Testicular  
: cancer rates are higher among police who do traffic patrol. Figure what the  
: power density is right at the mouth of a 17 db standard horn and you'll see  
: the levels they are getting are above ANSI limits. This is also why you should  
: never look into the antenna of a microwave transmitter, no matter if it is  
: very low power. The ERP can still be above safety limits at very close range.

All the units I have seen have a trigger on them - so called "instant on" units. There might be a high EM field, but no microwaves. Are the cops so stupid that they would rest the mouth of an active radar unit on their testicles? Highly unlikely.

Even if this were not true, I would expect the reflected waves to be much higher than any leakage signal through the casing. Add in standing waves, and you could get quite a few local hotspots - that would change position every time the unit moved a fraction of an inch.

Maybe the get the cancer from the sugar in their doughnuts.

Bill

---

Date: Tue, 11 Oct 1994 05:16:44 GMT  
From: finster@zeus.fasttax.com (David Finster)  
Subject: WTB: Radar gun...

In article <1994Oct10.075613.7018@hpcvaac.cv.hp.com> billn@hpcvaac.cv.hp.com (bill nelson) writes:  
>From: billn@hpcvaac.cv.hp.com (bill nelson)  
>Subject: Re: WTB: Radar gun...  
>Date: Mon, 10 Oct 1994 07:56:13 GMT

>jnormandin@umassd.edu (JERRY NORMANDIN) writes:  
> My first job after college was as an engineer at Lincoln Lab with the  
> LASER Group! Lasers are easily "absorbed". They use a frequency of

>: light that is easily absorbed with g.\$a#\*)(@@@ , I don't want  
> to get into trouble. Also LASER RADAR can be jammed just like  
> Microwave RADAR! You transmit the calibration signal!

>It can be absorbed - at least most of it can - if you are willing to  
>paint the complete front end of your automobile with the proper substance.  
>Windshields will also, in many cases, return a sufficiently strong signal.

>If they have a calibration signal. If they are using T and D radar, then  
>there is no such signal. Even if there was, the officer would know what  
>was happening, just as they know with current radar. Such jamming happens  
>to be highly illegal, for a number of reasons, and is likely to get you  
>into far more trouble than a simple speeding ticket.

I'm not trying to start anything, simply looking for clarification. Why would  
it be illegal to transmit infrared laser? I wasn't aware there were any  
regulations on transmitting light of any frequency/pulse duration or  
coherency. Am I simply misinformed? Or are there other laws in effect here?

I'll sit back and listen now...

-- Dave  
finster@fasttax.com

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Date: 11 Oct 1994 05:57:35 GMT  
From: steinr@ucs.orst.edu (Jean-Luc Picard)  
Subject: WTB: Radar gun...

In article <1994Oct11.044846.6240@hpcvaac.cv.hp.com>,  
bill nelson <billn@hpcvaac.cv.hp.com> wrote:

.....  
.....  
>  
> However, cops are in the habit of resting the guns in their laps when they  
> aren't actively clocking a vehicle, and they \*don't turn them off\* for the  
> entire shift. So they get a good near field dose to the testicles. Testicular  
> cancer rates are higher among police who do traffic patrol. Figure what the  
> power density is right at the mouth of a 17 db standard horn and you'll see  
> the levels they are getting are above ANSI limits. This is also why you should  
> never look into the antenna of a microwave transmitter, no matter if it is  
> very low power. The ERP can still be above safety limits at very close range.  
>  
>All the units I have seen have a trigger on them - so called "instant on"  
>units. There might be a high EM field, but no microwaves. Are the cops so  
>stupid that they would rest the mouth of an active radar unit on their  
>testicles? Highly unlikely.

>  
...  
...  
>  
>Maybe the get the cancer from the sugar in their doughnuts.  
>  
>Bill

Actually, most of the officers that get this form of cancer are motorcycle officers since they must rest their gun near this part of their body when chasing a car.

Also the officers in autos may incidentally rest the gun there if they throw it down in a hurry to chase a "speeder".

It's not done by choice, that's guaranteed...

--  
----- |C -----  
RAY STEIN                            --B\_1/  
OSU Electrical Engineering            |\    <<--COOL!  
----- |E -----  
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Date: 11 Oct 94 15:40:00 GMT  
From: HPS3@PSUVM.PSU.EDU (Dr. H. Paul Shuch)

ReferencesH. Paul, Shuch)  
Subject: Re: Bad News from VE30NT

How disappointing! But such is the nature of amateur radio endeavors.  
Thanks so much to you and the group for trying so hard. See you off  
OSCAR 0 some other time. Vy 73, Paul (n6tx@amsat.org)

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End of Info-Hams Digest V94 #1113  
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